~~Oroville Facilities Relicensing~~
~~Environmental Work Group~~
~~Draft Study Plan~~

~~SPW3.~~ SP-W3 Recreational Facilities and Operations Effects on Water Quality

~~Introduction~~

~~December 11, 2001~~February ~~14~~20, 2002

1.0 Introduction/Background

Existing and future operations and activities associated with ~~of~~ the Oroville Project recreational facilities, ~~operations, and activities~~ may have effects on the physical, chemical and biological integrity of water quality. The Environmental ~~Workgroup~~Work Group identified issues related to the recreational facilities and operations of the project. Issues identified included potential for introduction of nutrients, bacterial contamination at swim areas such as the North Forebay, sewage spills into Lake Oroville, fuel spills as a result of fluctuating lake levels, and contamination from boat maintenance and cleaning products.

Numerous recreational and related activities occur within the project boundary. Various bike, horse, and hiking trails, boat launching and maintenance facilities, camping areas, concessions, waste handling facilities, and swim areas have been developed in association with the project. The proximity of recreational facilities and their associated activities to the shoreline and banks of project waters offers potential for shoreline erosion and introduction of nutrients and bacterial contaminants. Recreational activities may also introduce contaminants into project waters, such as MTBE, oils and greases from watercraft operation and maintenance, petroleum hydrocarbons from fuel spills and floating gas tanks, and nutrients and bacteria from floating septic systems, restrooms, watercraft gray water tanks, and pump out facilities.

2.0 Study Objective

The objective of the study is to evaluate the potential effects of existing and planned activities associated with the Oroville Project recreational facilities ~~recreational facilities, operations, and activities~~ on the physical, chemical, and biological integrity of project waters. Effects from project facilities and operations to the integrity of project waters, as well as general water quality conditions, are evaluated in SPW1. This study will evaluate localized effects to water quality from specific recreational facilities and activities.

~~Relationship to Relicensing/Need for Study~~

3.0 Relationship to Relicensing /Need for the Study

Demonstration of compliance with water quality standards and other appropriate requirements are necessary in the application for water quality certification. Some physical, chemical, and biological data have

been collected from the North, Middle, and South forks of the Feather River near their confluences with Lake Oroville, from the reservoir itself, and downstream from Oroville Dam in the Feather River, Thermalito Power Canal, and Thermalito Afterbay. However, these data are not, nor were expected to be, sufficient to determine compliance with all Basin Plan Standards and appropriate goals and criteria protective of the designated beneficial uses. Therefore, additional water quality data are necessary for the application for water quality certification.

Information obtained from the study will be used to determine effects from recreational facilities, operations, and activities on the physical, chemical, and biological components of water quality, and the need for mitigation for impacts to water quality. This analysis is required for water quality certification by the ~~SWRCB.~~ State Water Resources Control Board ~~(SWRCB)~~. The water quality certification is needed ~~to file with the application~~ for license renewal with the Federal Energy Regulatory Commission ~~(FERC)~~.

~~Study Area~~

4.0 Study Area

The study area is generally within the FERC project boundary, but also includes adjacent lands and waterways for effects to project waters, and downstream for project effects in the Feather River. Specific water bodies included in the study area are the North, Middle, and South forks of the Feather River, West Branch and Concow Creek just above their confluences with the reservoir, Lake Oroville, Feather River downstream from Oroville Dam within the project boundary, Diversion Pool, Thermalito Forebay and Afterbay, and Oroville Wildlife Area ponds.

Study plans approved by the Environmental Work Group define the limits of the study area. If initial study results indicate that the study area should be expanded or contracted, the Environmental Work Group will discuss the basis for change and revise the study area as appropriate.

5.0 General Approach

Detailed* Methodology and Analysis *Procedures

This study will evaluate both current and potential future recreational facilities and operations. Some future recreational facilities and operations are known, but others will not be known until near the end of the study. Data obtained from the study will be compared to water quality goals and criteria for protection of beneficial uses. If initial study results indicate that the methods and tasks should be modified, the Environmental Work Group will discuss the basis for change and revise the study plans as appropriate.

Task ~~1. Effects~~1—Effects of Current Recreation Facilities and Operations

The first phase of the study will focus on evaluating the potential for recreation facilities, operations, and activities to affect water quality, and monitoring to determine any effects~~contamination~~. Information from recreation study plans will be obtained, as necessary, to evaluate the potential and sources of potential effects~~contamination~~ from recreation facilities, operations, and activities.

~~Sub-Task 1a. Evaluation~~ Task 1A— ~~Evaluation~~ Identification of Potential Effects to Water Quality for ~~Contamination~~ — ~~Contamination~~

The information about recreational facilities and activities in the Initial Information Package will be reviewed. The current Lake Oroville State Recreation Areas map will be reviewed for completeness

and updated to insure that all recreational facilities and activities discussed in the IIP are identified. In addition, this study will coordinate with recreational study plans (SP-R5, Assess Recreation Area Management; SP-R10, Recreation Facility and Condition Survey; and SP-R11, Recreation and Public Use Impact Assessment) to insure that all recreational facilities, activities, and effects are evaluated.

This information will be used to develop a table that lists each type of recreation facility or activity and potential effect to water quality, including potential contaminants and their sources. The potential effects to water quality will be determined during field visits to recreational facilities and empirical analysis of activities, and include evaluation of seasonal usage, source pathways, and operations and management of recreation facilities and activities that may contribute to contamination. Information derived from this Task will be used to identify and implement monitoring in Task 1B.

~~The potential types of contamination associated with each type of recreational facility and activity (Table SPW3-1) will be assessed. Field surveys will be conducted to determine potential sources of contamination from recreation facilities and activities. Operators of recreation facilities will be interviewed, recreation facilities visited, and recreational activities reviewed to determine potential for contamination to project waters. Seasonal usage will also be evaluated to determine temporal potential for contamination. The interviews and field visits will identify potential sources of contamination, potential contaminants, source pathways, and operations and management that may contribute to contamination.~~

~~Table SPW3-1. Recreational facilities, operations, and activities~~

~~Bike trail~~
~~Boating~~
~~Boat/car top access~~
~~Boat house~~
~~Boating/no power~~
~~Boat launch~~
~~Boat-in camping~~
~~Campfire center~~
~~Campground~~
~~Camping/group~~
~~Concessions~~
~~Dump station~~
~~Enroute camping~~
~~Equestrian trail~~
~~Equestrian camp~~
~~Fish cleaning station~~
~~Hiking~~
~~Hunting~~
~~Marina~~
~~Nature study~~
~~OHV-ATV~~
~~Picnicking~~
~~Restrooms~~
~~Floating restrooms~~
~~Swimming~~
~~Trailhead/with parking~~
~~Vista point~~
~~Visitor center~~
~~Wheelchair~~ ADA ~~access~~ facilities

Sub-Task 1b. Monitoring Task 1B—Monitoring for Potential Effects to Water Quality Contamination —

Specific monitoring will be developedtermined for each type of recreational facility and activity identified in Task 1A with potential to contaminateaffect project waters (Table 1). The monitoring plan will be presented to the Environmental Work Group for approval prior to implementation. Monitoring wouldill be implemented to target specific recreational facilities and activities with potential to introduce contaminants into affect water quality in project waters, such as marina operations, boat launch and maintenance facilitiies, developed and primitive campgrounds, floating campsites, beach areas (e.g., North Forebay Recreation Area, Bedrock Recreation Area), swimming areas, floating restrooms, houseboats and pumpout facilities, fishing facilities (e.g., fish cleaning stations, heavy fishing areas such as the Afterbay Outlet), hiking and bicycle trails, horse camp and horse riding trails, and picnic areas. The contribution of contaminants from wildlife will also be investigated where appropriate, such as waterfowl contribution to bacterial levels at swim areas. Monitoring would evaluate contaminant presence, source, and extent. Specific monitoring activities will be developed and implemented following determination of the potential for recreation facilities, operations, and activities to affect water quality. The monitoring program will be presented to the Environmental Work Group Task Force for review prior to implementation.

Monitoring for evaluation of effects to water quality from recreational facilities and activities would be dependent upon the type of recreational facility or activity and the period of impact. Parameters monitored may include erosion, turbidity, sedimentation, microbiological indicator organisms (i.e., coliform and enterococcus bacteria), periphyton (attached algae), petroleum byproducts (e.g., hydrocarbons, MTBE, oil and grease), metals, minerals, nutrients, and pesticides. WeeklyRoutine and event-based (e.g., holiday weekends, recreation or fishing tournaments, spills) water quality data collection would occur during the season for each recreation activityseason or event. Monthly or other appropriately timed (e.g., spills) monitoring would occur to determine effects from activities that occur throughout the year.

Task **2. Effects**2— Effects of existing and Ffuture or Planned operations and activities associated with the Oroville Project Rrecreational Ffacilities and ActivitiesEffects of Future Recreation Facilities and Operations

The Recreation WorkgroupWork Group will be evaluating project related recreational facilities and operations, and investigating the need for any changes to the current facilities or operations and the need for additional facilities in SP-R17 (Recreation Needs Analysis). As thisese groups develops proposals or recommendations for changes to existing facilities and operations or development of new facilities, the proposals will be evaluated for potential water quality effects. For example, a proposed increase in boat facilities may lead to increased boat usage on the reservoir, and hence increased contamination from petroleum products. Recommendations based on the analysis will be made to the appropriate group for any necessary modifications to minimize potential adverse effects to water quality.

Task 3. Progress Report—A progress report will be prepared at the conclusion of the first year of study. Interim output products will be identified through coordination with other Work Groups to meet their data needs.

Task 4. Final Report—A final report will be prepared following completion of the second year of the study.

6.0 Results and Products/Deliverables

Results

Information derived from this study will be used to determine whether recreational facilities, operations, and activities adversely affect the physical, chemical, and biological integrity of project waters. Information gathered through ~~interviews and~~ monitoring will be presented in tabular form identifying potential sources of contamination, potential contaminants, source pathways, operations and management of recreational facilities or activities that may contribute to contamination, and effectiveness of recreation facility or operations in preventing contamination. Water quality monitoring data obtained from this study will be compared to numerical and narrative water quality objectives of the ~~CVRWQB~~Central Valley Regional Water Quality Control Board ~~(CVRWQCB)~~ Basin Plan; numerical criteria of the U.S. EPA and California Department of Health Services drinking water maximum contaminant levels~~;~~ U.S. EPA California Toxics Rule criteria for freshwater aquatic life for dissolved metals~~;~~ U.S. EPA National Toxics Rule criteria for freshwater aquatic life for total recoverable metals~~; and~~ U.S. EPA National Ambient Water Quality Criteria for freshwater aquatic life protection; and agricultural goals for water quality from the Food and Agriculture Organization of the United Nations. The data will be presented in tables and graphs comparing monitoring data for the various types and locations of recreational activity with the various criteria.

Compliance with water quality objectives and criteria will be used to evaluate effects of recreation facilities and activities on designated beneficial uses as defined in the Basin Plan, which include municipal and domestic supply, agriculture, electrical power production, contact and non-contact recreation, warm-water and cold-water fish spawning, rearing and migration, freshwater habitat, and wildlife habitat. Mitigation measures will be investigated for parameters that do not meet Basin Plan ~~objectives~~standards.

Information derived from this study will be used by the SWRCB to determine conditions in the water quality certification to comply with Section 401 of the Federal Clean Water Act.

7.0 Coordination and Implementation Strategy

Coordination with Other Resource Areas/Studies

This study will provide some of the information necessary for determination of project compliance with water quality standards and other appropriate requirements in the application for water quality certification.

This study will collect and share data with ~~Study Plan SPW1 (Issue Sheet~~SP-#W1 (Issue ~~Statement W1, W2, and W3) and SPW7(Issue Sheet~~Study #WSP-W7 (Issue Statement W7)other water quality study plans, including SP-W1 (Project effects on water quality designated beneficial uses) and SP-W7 (Land and watershed management). The study will coordinate with the Recreation ~~Workgroup~~Work Group and their study plans in identifying ~~potential~~ current, planned, and proposed recreational facilities and activities that may ~~contaminate~~ affect water quality in project waters, and methods to reduce or eliminate potential contamination.

~~Schedule~~

Issues

This study plan provides information for evaluation of Issue Statement W5 (Effects of existing and future water-based recreation on water quality of project waters) and will provide information for determination of project compliance with water quality standards and other appropriate requirements in the application for water quality certification. This study directly or indirectly addresses the following specific issues:

Direct

- WE6. Fuel use at marinas – Floating gas tanks and sewer tanks
- WE35. Water contamination at North Forebay related to swimming opportunities
- WE38. Floating septic tanks
- WE39. Effects of boating on MTBE
- WE42. Floating restrooms, houseboat gray water tanks and pump out facilities effects on water quality
- WE43. Sewage spills into Lake Oroville
- WE44. Fuel spills as a result of fluctuating lake levels
- WE45. Effect on water quality from boat maintenance and cleaning products -- “biodegradable”

~~W4 – Effects of existing and future project operations and facilities and its associated recreational facilities, activities and uses on water quality. Proximity of project features and recreational facilities to shoreline and banks of water bodies offers potential for introduction of nutrients and bacterial contaminants to these waters. Issues Addressed: WE5, WE35, WE43, WE44, WE45, FE8, FE16, FE20, FE79~~

~~W5 – Effects of existing and future water-based recreation on water quality of project waters. Concerns include MTBE, oils and greases, fuel spills, floating gas tanks, floating septic systems, floating restrooms, houseboat gray water tanks (e.g., nutrients) and pump out facilities. Issues Addressed: WE6, WE35, WE38, WE39, WE42, WE43, WE44, WE45~~

8.0 Study Schedule

Task 1A of the study will begin in early 2002. The monitoring plan developed in ~~Sub-~~Task 1A~~a~~ will be presented to the Environmental ~~Workgroup~~Work Group or Task Force for review and concurrence in the spring of 2002. Monitoring for~~of~~ potential sources of contamination in Task 1B will then commence and continue for at least two years. Information obtained by the study will be presented to the Environmental ~~Workgroup~~Work Group ~~and Task Force~~ at quarterly intervals for review to evaluate the adequacy and progress of the study. Task 2 will provide additional analyses to evaluate effects from planned or proposed recreation facilities and operations, and will continue until all proposed recreation facilities and operations have been identified and evaluated. An interim~~draft~~ report will be prepared at the completion of each task, and a draft and final report will be prepared at the end of the study.

~~Issues~~

~~W4. Effects of existing and future project operations and facilities and its associated recreational facilities, activities and uses on water quality. Proximity of project features and recreational facilities to shoreline and banks of water bodies offers potential for introduction of nutrients and bacterial contaminants to these waters. Issues Addressed: WE5, WE35, WE43, WE44, WE45, FE8, FE16, FE20, FE79~~

~~W5. Effects of existing and future water-based recreation on water quality of project waters. Concerns include MTBE, oils and greases, fuel spills, floating gas tanks, floating septic systems, floating restrooms, houseboat gray water tanks (e.g., nutrients) and pump out facilities. Issues Addressed: WE6, WE35, WE38, WE39, WE42, WE43, WE44, WE45~~